

WHAT IS CLAIMED IS:

1. A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, said process cartridge comprising:

5 a cartridge frame;

an electrophotographic photosensitive drum;

10 a charging member for electrically charging said photosensitive drum;

15 a developing member for developing an electrostatic latent image formed on said photosensitive drum;

20 a developer accommodating portion for accommodating a developer to be used for developing the electrostatic latent image by said developing member;

25 an engaging member for being supported by a receiving portion of a movable member provided in the main assembly of said apparatus when said engaging member is in the main assembly of said apparatus,

30 wherein said engaging member is provided on a portion of said cartridge frame which takes an upper position when said process cartridge is inserted into the main assembly of the apparatus in a longitudinal direction thereof, at such a position as takes a downstream end position in a direction of insertion of said cartridge into the main assembly of said apparatus;

35 a first guide portion provided on a portion

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of said cartridge frame which takes an upper position
when said cartridge is inserted into the main assembly
of said apparatus in the longitudinal direction of
said photosensitive drum, at such a position as takes
5 a downstream position with respect to the direction of
insertion of said cartridge, wherein said first guide
portion is guided by a main assembly fixed guide
provided in the main assembly of said apparatus when
said cartridge is being inserted into the main
assembly of said apparatus;

10 a second guide portion provided on a portion
of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly
of said apparatus in the longitudinal direction of
15 said photosensitive drum, at such a position as takes
a downstream position with respect to the insertion of
said cartridge, wherein said second guide portion is
guided by a first guide recess provided in the main
assembly of apparatus when said cartridge is inserted
20 into the main assembly of the apparatus;

25 a third guiding portion provided on a portion
of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly
of the apparatus in the longitudinal direction of said
photosensitive drum, at such a position as takes an
upstream position in the direction of insertion of
said cartridge, wherein said third guide portion is

guided by a second guide recess provided in the main assembly of the apparatus when said cartridge is inserted into the main assembly of the apparatus;

5 a driving force receiving member provided at a downstream end portion with respect to the direction of insertion, wherein said driving force receiving member receives a driving force from a driving force transmitting member provided in the main assembly of apparatus; and

10 a positioning portion which is projected from said cartridge frame toward an upstream side with respect to the direction of insertion, wherein said positioning portion is disposed coaxially with said photosensitive drum, and wherein when said engaging member supported by said receiving portion is released to permit said cartridge to lower to the mount position, said positioning portion is supported by a positioning recess provided in the main assembly of the apparatus.

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20 2. A process cartridge Claim 1, wherein said second guide portion and said third guide portion are provided in said cartridge frame portion having said developer accommodating portion, and said engaging member and said first guide portion are provided in said cartridge frame portion an opposite cartridge frame portion.

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3. A process cartridge Claim 1 or 2, wherein by
operating a lever provided in the main assembly of the
apparatus, the movable member is lowered, and said
engaging member supported by said receiving portion is
5 released, so that cartridge lowers to the mount
position from the position in which it is inserted
into the main assembly of apparatus.

4. A process cartridge Claim 3, wherein when the
10 cartridge lowers, said second guide portion is in
engagement with said first guide recess, and said
third guide portion is in engagement with said second
guide recess, and said cartridge lowers by rotation
about said second guide portion and a third guide
15 portion to the mount position.

5. A process cartridge according to Claim 1, 2
or 3, wherein said engaging member is projected
upworldly beyond a top side of said cartridge frame
20 portion and is projected in the direction of insertion
beyond a leading end surface of said cartridge frame
portion, wherein said leading end surface is a surface
which takes a leading position when said cartridge is
inserted into the main assembly of the apparatus,
25 wherein said top side is a side which takes a top
position when said cartridge is inserted into the main
assembly of the apparatus.

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6. A process cartridge Claim 5, wherein said
engaging member is integrally formed with a leading
end cover constituting said cartridge frame, and
wherein said engaging member has a cylindrical
5 configuration, wherein said leading end cover takes a
leading end position when said cartridge is inserted
into the main assembly of the apparatus.

7. A process cartridge according to Claim 1, 2
10 or 3, wherein said first guide portion is projected
beyond in a side surface of said cartridge frame
portion in a direction crossing with the direction of
insertion, and said first guide portion has a
horizontal projected portion which is substantially
15 parallel with a top side of said cartridge frame
portion and a downward projected portion which
projects downwardly from said horizontal projected
portion, said downward projected portion has a bottom
end for being guided by said guide fixed in the main
20 assembly.

8. A process cartridge Claim 7, wherein said
first guide portion is integrally formed with a
leading end cover and a cleaning frame which
25 constitute said cartridge frame, wherein the leading
end cover takes a leading end position when said
cartridge is inserted into the main assembly of the

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apparatus.

9. A process cartridge according to Claim 1, 2
or 3, wherein said second guide portion is projected
5 downwardly from a bottom side of said cartridge frame
portion, and a leading end portion of said second
guide portion is engageable with a hole provided in
the main assembly of the apparatus, wherein the bottom
side takes a bottom position when said cartridge is
10 inserted into the main assembly of the apparatus.

10. A process cartridge Claim 9, wherein said
second guide portion is formed integrally with a
leading end cover constituting said cartridge frame,
15 wherein the leading end cover takes a leading end
position when said cartridge is inserted into the main
assembly of the apparatus.

11. A process cartridge according to Claim 1, 2
20 or 3, wherein said third guide portion is projected
downwardly from a bottom side of said cartridge frame
portion, wherein the bottom side takes a bottom
position when said cartridge is inserted into the main
assembly of the apparatus.

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12. A process cartridge Claim 11, wherein said
third guide portion is formed integrally with a

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trailing end cover constituting said cartridge frame, wherein the trailing end cover takes a trailing end position when said cartridge is inserted into the main assembly of the apparatus.

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13. A process cartridge according to any one of Claims 1, 7, 9 and 11, wherein a top side of said cartridge frame is provided with a first grip for being gripped when said cartridge is carried, and a training end portion of said cartridge frame is provided with a second grip for being gripped when said cartridge is inserted into or taken out of the main assembly of the apparatus.

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14. A process cartridge according to any one of Claims 1, 7, 9, 11 and 13, further comprising a positioning member provided at a leading end side with respect to the direction of insertion of the process cartridge, the positioning member extending so as to enclose said driving force receiving member, wherein a part of said positioning member is engaged with a positioning recess provided in the main assembly of the apparatus to be correctly position at a mount position in the main assembly of the apparatus.

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15. A process cartridge Claim 1, wherein said process cartridge moves from the mount position

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through 100 μ - 1mm in a direction crossing with the direction of the insertion, when said driving force receiving member is centered relative to said driving force transmitting member by receiving the driving force from said driving force transmitting member.

16. An electrophotographic image forming apparatus for forming an image on the recording material, to which a process cartridge is detachably mountable, said apparatus comprising:

- (a) a lever;
- (b) a movable member interrelated with said lever, said movable member having a receiving portion;
- (c) a fixed guide fixed in the main assembly;
- (d) a first guide recess;
- (e) a second guide recess;
- (f) a positioning recess provided in the main assembly;
- (g) a driving force transmitting member;
- (h) a process cartridge mounting portion for detachably mountable said process cartridge, said cartridge including:
 - a cartridge frame;
 - an electrophotographic photosensitive drum;
 - a charging member for electrically charging said photosensitive drum;
 - a developing member for developing an

electrostatic latent image formed on said
photosensitive drum;

a developer accommodating portion for
accommodating a developer to be used for developing
5 the electrostatic latent image by said developing
member;

an engaging member for being supported by a
receiving portion of a movable member provided in the
main assembly of said apparatus when said engaging
10 member is in the main assembly of said apparatus,
wherein said engaging member is provided on a portion
of said cartridge frame which takes an upper position
when said process cartridge is inserted into the main
assembly of the apparatus in a longitudinal direction
15 thereof, at such a position as takes a downstream end
position in a direction of insertion of said cartridge
into the main assembly of said apparatus;

a first guide portion provided on a portion
of said cartridge frame which takes an upper position
20 when said cartridge is inserted into the main assembly
of said apparatus in the longitudinal direction of
said photosensitive drum, at such a position as takes
a downstream position with respect to the direction of
insertion of said cartridge, wherein said first guide
25 portion is guided by a main assembly fixed guide
provided in the main assembly of said apparatus;

a second guide portion provided on a portion

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of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly
of said apparatus in the longitudinal direction of
said photosensitive drum, at such a position as takes
5 a downstream position with respect to the insertion of
said cartridge, wherein said second guide portion is
guided by a first guide recess provided in the main
assembly of apparatus when said cartridge is inserted
into the main assembly of the apparatus;

10 a third guiding portion provided on a portion
of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly
of the apparatus in the longitudinal direction of said
photosensitive drum, at such a position as takes an
15 upstream position in the direction of insertion of
said cartridge, wherein said third guide portion is
guided by a second guide recess provided in the main
assembly of the apparatus when said cartridge is
inserted into the main assembly of the apparatus;

20 a driving force receiving member provided at
a downstream end portion with respect to the direction
of insertion, wherein said driving force receiving
member receives a driving force from a driving force
transmitting member provided in the main assembly of
apparatus; and

25 a positioning portion which is projected from
said cartridge frame toward an upstream side with

respect to a direction of insertion, wherein said
positioning portion is disposed coaxially with said
photosensitive drum, and wherein when said engaging
member supported by said receiving portion is released
5 to permit said cartridge to lower to the mount
position, said positioning portion is supported by a
positioning recess provided in the main assembly of
the apparatus;

10 17. An apparatus according to Claim 16, wherein
said fixed guide is disposed adjacent one end of said
cartridge mounting portion with respect to a direction
crossing with the direction of insertion, and is
extended in the direction of insertion from an inlet
15 side for insertion of the process cartridge to the
cartridge mounting portion toward a rear side, wherein
said fixed guide is provided with a recess engageable
with said first guide portion.

20 18. An apparatus according to Claim 16 or 17,
wherein said first guide recess and said second guide
recess are disposed adjacent the other end portion of
said cartridge mounting portion with respect to a
direction crossing with the direction of insertion,
25 wherein said second guide recess is disposed adjacent
an entrance portion of said mounting portion, and said
first guide recess is disposed at a rear side of said

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mounting portion, and wherein a flat guide portion is provided between said first guide recess said second guide recess.

5 19. A cartridge mounting method for mounting a process cartridge to a main assembly of an electrophotographic image forming apparatus, said method comprising:

10 (a) a step of providing in the main assembly of said electrophotographic image forming apparatus a lever,

a movable member interrelated with said lever and having a receiving portion

15 a fixed guide,

a first guide recess,

a second guide recess,

a positioning recess and

a driving force transmitting member;

20 (b) a step of providing in the process cartridge,

a cartridge frame,

an electrophotographic photosensitive drum,

a charging member for electrically charging said photosensitive drum,

25 a developing member for developing an electrostatic latent image formed on said photosensitive drum,

a developer accommodating portion for
accommodating a developer to be used for developing
the electrostatic latent image by said developing
member,

5 an engaging member for being supported by
said receiving portion when said engaging member is in
the main assembly of said apparatus, wherein said
engaging member is provided on a portion of said
cartridge frame which takes an upper position when said
10 process cartridge is inserted into the main assembly
of the apparatus in a longitudinal direction thereof,
at such a position as takes a downstream end position
in a direction of insertion of said cartridge into the
main assembly of said apparatus;

15 a first guide portion provided on a portion
of said cartridge frame which takes an upper position
when said cartridge is inserted into the main assembly
of said apparatus in the longitudinal direction of
said photosensitive drum, at such a position as takes
20 a downstream position with respect to the direction of
insertion of said cartridge, wherein said first guide
portion is guided by said fixed guide when said
cartridge is being inserted into the main assembly of
said apparatus;

25 a second guide portion provided on a portion
of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly

of said apparatus in the longitudinal direction of
said photosensitive drum, at such a position as takes
a downstream position with respect to the insertion of
said cartridge, wherein said second guide portion is
5 guided by a first guide recess said cartridge is
inserted into the main assembly of the apparatus,

a third guiding portion provided on a portion
of said cartridge frame which takes a lower position
when said cartridge is inserted into the main assembly
10 of the apparatus in the longitudinal direction of said
photosensitive drum, at such a position as takes an
upstream position in the direction of insertion of
said cartridge, wherein said third guide portion is
guided by a second guide recess when said cartridge is
15 inserted into the main assembly of the apparatus,

a driving force receiving member provided at
a downstream leading end portion with respect to the
direction of insertion, wherein said driving force
receiving member receives a driving force from a
20 driving force transmitting member, and

a positioning portion which is projected from
said cartridge frame toward an upstream side with
respect to a direction of insertion, wherein said
positioning portion is disposed coaxially with said
25 photosensitive drum, and wherein when said engaging
member supported by said receiving portion is released
to permit said cartridge to lower to the mount

position, said positioning portion is supported by a positioning recess provided in the main assembly of the apparatus; and

(c) a step of inserting said process
5 cartridge into the main assembly of said apparatus with said first guide portion being guided by said fixed guide, with said second guide portion being guided by said first guide recess, and with said second guide portion being guided by said second guide
10 recess; causing said engaging member to be supported by said receiving portion; and thereafter, releasing said engaging member from said receiving portion by operating said movable member, so that cartridge is let fall to the mount position.

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20. A cartridge mounting method according to
Claim 19, wherein said second guide portion and said third guide portion are provided in said cartridge frame portion having said developer accommodating portion, and said engaging member and said first guide portion are provided in said cartridge frame portion an opposite cartridge frame portion.

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21. A cartridge mounting method according to
Claim 19 or 20, wherein by operating a lever provided in the main assembly of the apparatus, the movable member is lowered, and said engaging member supported

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by said receiving portion is released, so that cartridge lowers to the mount position from the position in which it is inserted into the main assembly of apparatus.

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22. A cartridge mounting method according to Claim 21, wherein when the cartridge lowers, said second guide portion is in engagement with said first guide recess, and said third guide portion is in engagement with said second guide recess, and said cartridge lowers by rotation about said second guide portion and a third guide portion to the mount position.

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23. A cartridge mounting method according to Claim 19, 20, 21 or 22, wherein said engaging member is projected upworldly beyond a top side of said cartridge frame portion and is projected in the direction of insertion beyond a leading end surface of said cartridge frame portion, wherein said leading end surface is a surface which takes a leading position when said cartridge is inserted into the main assembly of the apparatus, wherein said top side is a side which takes a top position when said cartridge is inserted into the main assembly of the apparatus.

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24. A cartridge mounting method according to

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Claim 23, wherein said engaging member is integrally formed with a leading end cover constituting said cartridge frame, and wherein said engaging member has a cylindrical configuration, wherein said leading end cover takes a leading end position when said cartridge is inserted into the main assembly of the apparatus.

25. A cartridge mounting method according to
Claim 19, 20 or 21, wherein said first guide portion
10 is projected beyond in a side surface of said
cartridge frame portion in a direction crossing with
the direction of insertion, and said first guide
portion has a horizontal projected portion which is
substantially parallel with a top side of said
15 cartridge frame portion and a downward projected
portion which projects downwardly from said horizontal
projected portion, said downward projected portion has
a bottom end for being guided by said guide fixed in
the main assembly.

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26. A cartridge mounting method according to
Claim 25, wherein said first guide portion is
integrally formed with a leading end cover and a
cleaning frame which constitute said cartridge frame,
25 wherein the leading end cover takes a leading end
position when said cartridge is inserted into the main
assembly of the apparatus.

27. A cartridge mounting method according to
Claim 19, 20 or 21, wherein said second guide portion
is projected downwardly from a bottom side of said
cartridge frame portion, and a leading end portion of
5 said second guide portion is engageable with a hole
provided in the main assembly of the apparatus,
wherein the bottom side takes a bottom position when
said cartridge is inserted into the main assembly of
the apparatus.

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28. A cartridge mounting method according to
Claim 19, wherein said second guide portion is formed
integrally with a leading end cover constituting said
cartridge frame, wherein the leading end cover takes a
15 leading end position when said cartridge is inserted
into the main assembly of the apparatus.

20 29. A cartridge mounting method according to
Claim 19, 20 or 21, wherein said third guide portion
is projected downwardly from a bottom side of said
cartridge frame portion, wherein the bottom side takes
a bottom position when said cartridge is inserted into
the main assembly of the apparatus.

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30. A cartridge mounting method according to
Claim 29, wherein said third guide portion is formed
integrally with a trailing end cover constituting said

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cartridge frame, wherein the trailing end cover takes a trailing end position when said cartridge is inserted into the main assembly of the apparatus.

5 31. A cartridge mounting method according to any one of Claims 19, 25, 27 and 29, wherein a top side of said cartridge frame is provided with a first grip for being gripped when said cartridge is carried, and a training end portion of said cartridge frame is
10 provided with a second grip for being gripped when said cartridge is inserted into or taken out of the main assembly of the apparatus.

15 32. A cartridge mounting method according to any one of Claims 19, 25, 27 and 29, further comprising a positioning member provided at a leading end side with respect to the direction of insertion of the process cartridge, the positioning member extending so as to enclose said driving force receiving member, wherein a
20 part of said positioning member is engaged with a positioning recess provided in the main assembly of the apparatus to be correctly position at a mount position in the main assembly of the apparatus.

25 33. A cartridge mounting method according to Claim 19, wherein said process cartridge moves from the mount position through $100\mu - 1\text{mm}$ in a direction

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crossing with the direction of the insertion, when
said driving force receiving member is centered
relative to said driving force transmitting member by
receiving the driving force from said driving force
transmitting member.

5 34. A cartridge mounting method according to
Claim 19, wherein said fixed guide is disposed
adjacent one end of said cartridge mounting portion
10 with respect to a direction crossing with the
direction of insertion, and is extended in the
direction of insertion from an inlet side for
insertion of the process cartridge to the cartridge
mounting portion toward a rear side, wherein said
15 fixed guide is provided with a recess engageable with
said first guide portion.

20 35. A cartridge mounting method according to
Claim 19 or 17, wherein said first guide recess and
said second guide recess are disposed adjacent the
other end portion of said cartridge mounting portion
with respect to a direction crossing with the
direction of insertion, wherein said second guide
recess is disposed adjacent an entrance portion of
25 said mounting portion, and said first guide recess is
disposed at a rear side of said mounting portion, and
wherein a flat guide portion is provided between said

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first guide recess said second guide recess.

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